

costs are not incurred by the incumbent.²⁶ And, of course, if the CLEC is forced to purchase the network element from another source at a price that exceeds the incumbent LEC's cost (per unit) of self-providing that network element (*i.e.*, TELRIC per unit), then the CLEC has higher costs than the LEC.

54. Even if the incumbent LECs may be earning excess long-run profits on their network services (including local service, exchange access, and universal service subsidies), such returns need not motivate a CLEC to commit its capital to enter a particular market unless the CLEC can reasonably expect to achieve cost levels comparable to those of the incumbent LEC. A contrary conclusion ignores the likely incumbent LEC response to broad-scale entry that we described in our initial affidavit.²⁷

55. Finally, it is worth noting that any fear that CLECs are getting a "free ride" because they undercompensate the incumbent LECs for UNEs is contradicted by the fact that many CLECs (including AT&T) are investing substantial sums to avoid relying on the incumbent LECs for network elements. As we explained in our initial affidavit, that is because relying on incumbent LECs' UNEs places CLECs at a significant competitive disadvantage. Moreover, there have been few, if any, significant UNE deals between CLECs and the

²⁶ For example, when the CLEC leases unbundled loops, but deploys its own switch, the CLEC incurs significant costs to bring the customer's loop from the incumbent LEC's wire center to the CLEC's switch.

²⁷ See Hubbard-Lehr-Willig Aff. ¶ 18 ("Fundamental economic principles dictate that price competition will drive a relatively high-cost firm out of a market. If a firm has higher costs than its rivals, the natural competitive process inevitably will propel prices below the costs of the high-cost firm, forcing it to exit the market. Moreover, a rational CLEC will anticipate this outcome of the competitive process and, if it knows it would have higher costs than the incumbent LEC in a particular market, it simply will choose not to commit its liquid capital to enter that market in the first place. In other words, a CLEC will enter a particular market only if it anticipates that its costs will not exceed those of the incumbent LEC for a similarly desirable product").

incumbents on a major scale. If UNEs were such a great deal, CLECs should be leaping into these allegedly gamed environments in order to establish a huge competitive beach head in local telecommunications by building rapidly a UNE-based network. In other words, if it was a free-ride, CLECs should be jumping on, but they are not because entering telecommunications is very risky, very costly, and still inhibited by the incumbent LEC actions that have the effect of precluding competition.

IV. TELRIC PRICING DOES NOT STIFLE INNOVATION INCENTIVES.

56. The incumbent LECs' economists invoke much argument and rhetoric in an attempt to convince the Commission that TELRIC based pricing will "destroy" the incentive for incumbent LECs to innovate.²⁸ More precisely, the economists assert that incumbent LECs will not undertake costly research and development to bring to the market new services and products if they are required to give competitors access to the underlying facilities at cost-based rates.²⁹ According to the economists, "if the investment succeeds, the CLEC can purchase the ILEC's unbundled element at cost, as set by TELRIC. If the new investment fails, the CLEC does not bear any of the cost, but the ILEC's shareholders bear the cost of the unsuccessful investment."³⁰ Thus, these economists assert that if incumbent LECs are to innovate they must

²⁸ Kahn ¶ 22; Hausman-Sidak ¶¶ 75-79; Jorde-Sidak-Teece ¶¶ 31-41.

²⁹ Kahn ¶ 22; Hausman-Sidak ¶¶ 75-79; Jorde-Sidak-Teece ¶¶ 31-41.

³⁰ Hausman-Sidak ¶ 76. *See also* Kahn ¶ 22; Jorde-Sidak-Teece ¶¶ 37-38.

be either compensated with supracompetitive returns, or are entitled to deny competitors access to new facilities altogether.³¹

57. These arguments amount to nothing more in the present context than misplaced drama. For example, Hausman-Sidak (Aff. ¶ 59) give the hypothetical of a pharmaceutical company that is forced to sell its successful products to generic competitors at incremental cost but that recovers nothing on their unsuccessful attempts. But by attempting to shift industries in this fashion, they miss the point. Our position is not that incumbent LECs are required, as a general matter, to unbundle any new, innovative facility, but rather only those functions that are inextricably linked to the bottleneck properties. Thus the hypothetical is entirely misplaced because a drug is not an input that a rival needs to compete in the marketplace.

58. As discussed above, we do not recommend unlimited unbundling forever. The sound economic argument is that only those functionalities that are linked to the “bottleneck” are the proper subjects for unbundling. Those functionalities that are not closely linked to the bottleneck need not be unbundled, *i.e.*, unbundling and TELRIC are not being proposed for competitive markets or for assets and services that are not directly linked to the provision of local exchange and exchange access. However, local exchange and exchange access markets are not competitive.³²

59. By contrast, if the incumbent LECs were to develop an innovating IP technology unlinked to its local exchange and local access bottleneck facilities, then those truly innovative

³¹ Kahn ¶ 22 & n.10; Hausman-Sidak ¶ 77; Jorde-Sidak-Teece ¶¶ 36-27; Aron-Harris at 18-20; Crandall ¶ 14.

³² See William H. Lehr and R. Glenn Hubbard, Improving Local Exchange Competition: Regulatory Crossroads (February 1998), *mimeo*.

technologies would not need to be unbundled.³³ Such innovative IP services or facilities might be spun off into a separate subsidiary and be excluded from the unbundling requirements altogether.³⁴ Also, unbundling is not sweeping today, even if the Commission grants all the unbundling proposals in this proceeding. For example, if the incumbent LECs have developed or develop very efficient back-office systems that give them a cost advantage, CLECs would not be entitled to those innovations. Moreover, although a CLEC can obtain an incumbent LEC's directory listings, it may not be entitled to the incumbent LEC's innovative search engines used to provide directory assistance.³⁵

60. While infrastructure sharing like that created by unbundling requirements may have some negative effects on the incentives of incumbent LECs to innovate, these effects are

³³ It is our understanding that ADSL type data services have been technologically available for a long time and are inextricably tied to the quintessential network element, the local loop. ADSL is simply a functionality supported by the local loop, just as the local loop is capable of being used to provide other functionalities (2-wire analog, 4-wire analog, etc.). And, of course, most of the infrastructure used to provide ADSL services – local loops – already have been paid for by monopoly ratepayers. Consequently, it is easy to overemphasize the dangers of repressed investment in ADSL from unbundling imposed on the bottleneck infrastructure.

³⁴ There is a competitive danger here: an incumbent LEC's intent of get around the unbundling requirement for "standard" loops and functionalities could move these new services into deregulated separate subsidiaries and use them as effective substitutes for the UNEs that have to be offered to the CLECs. These UNEs would be degraded and CLECs would continue to be disadvantaged. This same problem arises if regulators commit themselves not to place new UNEs into the "unbundled" bucket. If these new UNEs were excellent substitutes for the old UNEs (xDSL vs. the standard twisted pair) then the incumbent LEC has the incentive to shift service onto these new products and underinvest in the UNEs that have been classified for unbundling. Put another way, if some substitute UNEs were declassified, incumbent LECs would have the incentive to transfer monopoly power – control over the bottleneck – to these declassified UNEs.

³⁵ A CLEC relying on unbundled OS/DA would gain the benefits of these search processes. Nevertheless, it is our understanding that OS/DA unbundling may not be required once incumbent LECs broadly have tested and deployed customized routing solutions and made their directory listings available on nondiscriminatory rates, terms, and conditions.

small and easily outweighed by the favorable incentive effects of competition.³⁶ Monopolists unthreatened by actual or potential competition do not have enhanced incentives to innovate. In fact, innovation can cannibalize their existing services just as, we understand, ADSL type services undermine incumbent LECs' existing ISDN offerings.

61. Competition, on the other hand, generates a powerful incentive to innovate because then market innovation is not only driven by incumbent LECs' incentive to make additional returns. It is additionally driven by the fact that others are also investing in new facilities and services. For example, to bring cable-based telephone and broadband Internet access to the general public, AT&T is investing approximately \$100 billion into cable. Simultaneously, facilities-based telephony and advanced-services competition is emerging. Incumbent LECs will have to innovate in order to maintain their market position in the long term.

62. This scenario is already playing out with respect to ADSL services. It is our understanding that companies like Covad are leasing unbundled loops and then deploying their own ADSL equipment thereby making high-speed data services available to customers. In response to offerings like Covad and the advent of cable modem availability, the incumbent LECs finally have begun offering their own competitive ADSL services.³⁷ Such pro-competitive

³⁶ Actually, the source of the potential disincentive is less in unbundling than in the risk that the element's rate is too low relative to the *ex ante* risks incurred in the development of the new functionality, something that, it is our understanding, incumbent LECs have failed to demonstrate in state rate proceedings.

³⁷ It should be noted that ADSL and other DSL technology are not a recent innovation, but actually were developed by Bell Labs in the late 1980s. See Alan Stewart Martyn Warwick, "Technology Trapped? ADSL." *Communications International* (Nov. 1, 1996). Incumbent LECs, then, are actually implementing an old technology in response to a new competitive threat.

forces clearly must be placed against whatever diminution (if any) in the incumbent LEC's incentives to innovate that may be engendered by unbundling. Competition will be promoted through widespread UNE availability and will stimulate incentives. Once competition takes hold, regulations can be lifted and the market will become the sole driver and arbiter of success.

63. Another beneficial feature of TELRIC based UNE rates is that, even with respect to bottleneck and bottleneck linked elements, they do not retard facilities-based entry where such entry is efficient and sustainable. Any concern that network elements priced at TELRIC would be so "cheap" as to deter efficient facilities-based entry is misplaced. TELRIC is a measure of incremental cost, not marginal cost, and therefore includes all of the additional costs that society incurs by asking the incumbent carrier to supply the output of a network element. If another carrier cannot produce that output as cheaply itself, then its facilities-based entry would waste resources and should not occur.

64. The Commission further should not be solely guided in its decision by the overblown concern that TELRIC UNE rates provide an across the board "free-ride" on incumbent LEC investments. Rather, UNEs priced at such efficient levels may overcompensate the incumbent LEC for some past and future investments, while possibly undercompensating them for others. All the rhetorical weight should not be placed on the latter without acknowledging the former. Afterall, UNEs are a launch pad for facilities-based entry because they reduce impediments to full-fledged facilities-based entry. UNE-based entry will enable entrants quickly to build relationships with end users based on marketing, customer service, and innovative modification or additions to existing network elements, without incurring all of the risk inherent in making the enormous investments needed to build every element of an entire network simultaneously from scratch. The resulting commercial relationships with end users

should in turn serve as a powerful springboard for integration backward through further facilities-based entry, a step that, as we have just discussed, may be necessary for CLECs to eliminate the significant costs and difficulties they encounter when relying on UNEs.

65. Just as importantly, as we explained in our original affidavit, entrants into local telecommunications markets face significant hurdles even when they can purchase UNEs at TELRIC. Their retail costs per customer most likely will be much higher than the incumbent LECs because a CLEC must establish a brand name and develop a reputation as a quality supplier of local exchange services before it can overcome the incumbent's long-standing customer relationships and win away customers. CLECs also will incur significant setup costs such as the creation of back-office operations that the incumbent LECs long ago incurred and that monopoly ratepayers have already paid for. Entrants face a very high level of risk associated with their local entry efforts. Not only are they entering monopolized markets dominated by entrenched incumbents, they are entering without the incumbent's knowledge about local operating conditions including local operating costs (*e.g.*, location and quality of outside plant facilities) and consumer demand (*e.g.*, peak traffic volumes over certain facilities and demand growth). This information asymmetry increases the risk that the CLEC will fail to deploy facilities optimally and therefore increases the overall risk of entering the local telecommunications business. In addition, by relying on UNEs, CLECs necessarily disclose strategically sensitive information about their operations that the incumbent LEC could use to shape effective competitive responses. Finally, there are significant costs of dealing with the delaying tactics that the incumbent LECs have deployed in regulatory and other fora.

66. CLECs may reduce this competitive disadvantage in many markets by migrating from UNEs to their own facilities. Hence, UNEs are likely to serve only as a bridge to facilities-

based competition in those markets that can support multiple facilities-based competitors. In those that cannot, UNEs will be the only means by which competition can discipline incumbent LEC behavior, albeit imperfectly.

67. Professor Kahn chides two of us (Ordover and Willig) for an alleged failure to “reconcile” our argument that “government restrictions can stifle innovation incentives with [our] previous advocacy of TELRIC pricing for access to ILEC networks.”³⁸ But, of course, there is no such internal contradiction in our writings or in our public policy prescriptions.

68. As is made clear in the lengthy citation that Professor Kahn includes in his affidavit, our economic analysis and public policy prescriptions were tailored to the issues at hand, namely, whether “the last mile broadband data transport facilities” over cable network should be unbundled. There is a wide gulf between the competitive environments prevailing in the provision of telecommunications network elements and in the provision of the broadband, high speed Internet access. As we demonstrated in the Declaration cited by Professor Kahn, last mile broadband transport was not (and is not) a bottleneck element and did not offer any functionality that was directly tied to the bottleneck. On the contrary, the service in question was not universally available, entailed a technology whose feasibility was not yet fully tested, and was (and continues to be) subject to competitive constraints from the incumbent LECs deploying their own broadband services, as well as from traditional (narrow band) internet access providers. Further, AT&T and other cable telephony and Internet providers are proposing to *enter* a market currently dominated by the incumbent LECs and, consequently, owners of cable infrastructure with their virtually non-existent market shares do not control bottleneck facilities.

³⁸ Kahn at 34, para. 48 n. 40 citing to Declaration of Professors Janusz A. Ordover and Robert D. Willig in CS Docket No. 98-178, November 13, 1998.

69. These are not the competitive conditions that currently prevail in the provision of unbundled network elements that are the subject of this Docket and which were not the subject of unbundling provisions of the Act. On the contrary, these UNEs and the functionalities based on to them are a bottleneck into competitive provision of local exchange and local access telecommunications services. We, like Professor Kahn, are of the view that innovative services that are clearly not linked to the bottleneck network elements should not be subjected to unnecessary unbundling requirements at TELRIC-based rates. However, it is sound public policy to require such unbundling for services that are linked to the bottlenecks into the provision of local exchange and access services that are controlled by the incumbent LECs.

V. PRICING RULES SHOULD NOT VARY BY GEOGRAPHY AND THE COMMISSION SHOULD NOT ADOPT ANY SUNSET PROVISIONS FOR UNES.

70. The incumbent LEC economists' arguments in favor of geographically diverse unbundling rules hinge on three basic points. First, they argue that unbundling should be minimized, or eliminated, because of negative effects on innovation incentives.³⁹ As we have already shown, however, unbundling in the context of local telecommunications services will, on balance, encourage facilities-based competition and innovation. Second, they argue that market-specific (both product and geographic) rules are necessary under an essential facilities or other antitrust type inquiry.⁴⁰ But, as we have demonstrated, at this point the Commission should not look to the antitrust laws generally, nor to the essential facilities doctrine particularly, in defining the impairment or necessary standards.

³⁹ Hausman-Sidak ¶¶ 75-79.

⁴⁰ *Id.* ¶¶ 94-130.

71. The only possible justification, then, for not adopting national unbundling requirements hinges on the likelihood that they might not leave adequate scope for accommodating local or regional differences.⁴¹ According to the critics of national rules, such rules are “imperfect” because they are insensitive to local competitive conditions. The Commission, however, can address this concern by specifying only national *minimum* unbundling rules – leaving it to the states to add additional elements if local conditions warrant it. Moreover, as we argue below, rules that might emerge through litigation at a local level – either in courts or in regulatory fora – are also likely to be even more imperfect at any one point in time.

72. The Commission’s national unbundling rules are important because they reduce entrants’ implementation and compliance costs in a number of ways. First, national rules encourage the development of common interfaces and procedures. More specifically, they reduce uncertainty and arbitrary regional differences, thereby reducing entry costs for entrants seeking to compete in multiple states. Put another way, uniform national rules make it possible for a CLEC contemplating entry broadly across different states and incumbent LEC territories, as well as in urban, suburban, and rural areas, to develop a coherent entry plan. Variability in the types of UNEs available from one geographic area to another may force a CLEC to use radically different entry modes in each area not because the economics of local telecommunications necessarily differ substantially between those areas, but because different state commissions had

⁴¹ *Accord* Aron-Harris at 36-37; Hausman-Sidak ¶¶ 169-70.

adopted different public policies regarding local competition.⁴² In this respect, national rules facilitate the realization of scale and scope economies.

73. Second, national rules reduce regulatory uncertainty and, equally important, litigation cost. Because Congress understood that the incumbent LECs would not cooperate willingly with unbundling requirements, Congress mandated that the Commission specify rules as to how these pro-competitive local interconnection provisions should be implemented. The fact that CLECs would need to rely on the unwilling cooperation of their strongest direct competitor to survive and compete effectively in the market presented regulators with a difficult implementation challenge and the incumbent LEC with multiple opportunities to engage in anticompetitive efforts to raise rivals' costs. The incumbent LECs' efforts to delay implementation of the pro-competitive provisions of the Act by engaging in regulatory appeals and litigation at virtually every opportunity provides an obvious example of how the incumbent LECs pursue this goal in practice.

74. Third, national rules can ease interconnection negotiations and, when necessary, the complexity and cost of arbitration.

75. Fourth, national rules help promote national best practices and facilitate regulatory benchmarking, lowering monitoring costs. These important cost savings are recognized by the FCC and support the FCC's tentative conclusion to reaffirm national unbundling standards.⁴³ In fact, it is more than plausible that the locally-tailored rules for

⁴² For example, it is our understanding that the Illinois Commerce Commission and the Ohio Public Utility Commission have very different views about the network elements that incumbent LECs should be required to unbundle despite the fact that there is little evidence to suggest that one of those states is significantly more competitive than the other.

⁴³ See *Second Further Notice of Proposed Rulemaking* ¶ 13.

unbundling and pricing could prove even more “imperfect” than the minimum list promulgated by the Commission. In particular, there is no reason to assume that invariably locally-driven litigation over the extent of unbundling would produce the most efficient outcome. First, to some extent, the outcome of such litigation is always unpredictable. Second, the costs can be quite significant. Third, the process is not instantaneous but, rather, is inherently slow and can be further gamed and prolonged. In fact, the greater is the need for “local rules” the higher will be the incentives to litigate the matter and the higher will be the attendant risks and costs.

76. It is our understanding that the slate of UNEs identified in the *First Report and Order* are required by CLECs in all local regions to compete effectively. Hence, while there may be a basis for applying divergent additional unbundling requirements to account for within-region differences in the competitive environment (*e.g.*, requiring sub-loop unbundling in wire centers for which facilities-based competition is not likely for a long time to enable broadband access), there is no reasonable basis for requiring less than the minimum national slate of UNEs in an incumbent LEC’s region or in a particular state because some wire centers face some competition from facilities-based carriers.

77. Although the Act when implemented is likely to promote substantial local competition because of its impact in lowering the costs of entry, implementation has been delayed, in part, due to the active opposition of the incumbent LECs. Hopefully, the Supreme Court decision will put an end to the incumbent LECs’ ability to delay implementation of the Act by resisting the authority of the FCC and reasonable unbundling provisions.

78. Finally, the incumbent LECs' economists suggest that the Commission should adopt sunset provisions for any network elements that are unbundled.⁴⁴ We believe this would be inappropriate. Once robust wholesale markets for local exchange facilities exist, the incumbent LECs will no longer retain substantial market power and local markets should be irreversibly competitive, like long distance markets are today. Once local markets are competitive, it will be desirable and possible to eliminate the unbundling provisions imposed on the incumbent LECs by the Act. While these developments hopefully will happen relatively quickly, until effective and sustainable local competition emerges and takes hold, the network unbundling provisions of the Act and TELRIC-based pricing should remain in place for the public interest

79. Explicit sunset provisions would be counterproductive because they would lessen incentives of the incumbent LECs to comply with the Act and would increase entry costs. Further, sunset rules could discourage nationwide entry by CLECs because they would realize that in those markets where they are likely to remain dependent on UNEs, their entry would likely become unprofitable over the long haul.

80. By contrast, once robust wholesale markets for these facilities emerge, UNE requirements will no longer be necessary because those carriers which wish to continue to lease facilities will be able to obtain them in the wholesale markets at prices that should approximate TELRIC. This is how competition works. However, until such competition emerges, relaxation of the UNE standards will impair the development of local exchange competition. As we explained above, the idea of the Act's pro-competitive rules is to promote competition and to deliver the benefits of competition to consumers – something that only can be achieved if

⁴⁴ Hausman-Sidak ¶¶ 165-66.

incumbent LECs face an irrevocable threat of competition. Sunset rules that promise that the pro-competitive provisions of the Act will be relaxed whether or not competition actually emerges and takes hold will directly undermine the ability of the Act to accomplish its aims

VI. CONCLUSIONS

81. For the reasons we have discussed in our initial affidavit and in this subsequent affidavit, the Commission would best serve the interests of consumers and promote competition by adopting a competitive standard in determining whether or not an incumbent LEC's failure to unbundle a network element would impair a CLEC's ability to offer services. Unbundling of bottleneck facilities at TELRIC rates as well as facilities closely linked to the bottleneck will engender rapid advances in local competition and provide consumers with the benefits of lower prices and greater choice even in those areas where market conditions cannot support multiple facilities-based competitors. For such facilities, TELRIC rates are compensatory and, on balance, do not discourage innovation.

82. By contrast, the essential facilities doctrine should play no role in guiding the Commission's determinations of impairment. Congress in the Telecommunications Act affirmatively sought to break up local monopolies and rapidly promote competition. That doctrine is primarily concerned with an anticompetitive extension of monopoly power from one market to another, not the conscious substitution of competition in place of monopolies.

**Affidavit of
R. Glenn Hubbard**

I declare under penalty of perjury that the foregoing is true and correct. Executed on
June 10, 1999.


R. Glenn Hubbard

**Affidavit of
William H. Lehr**

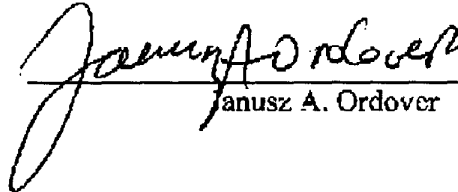
I declare under penalty of perjury that the foregoing is true and correct. Executed on
June 3, 1999.

A handwritten signature in black ink, appearing to be 'WHL', written over a horizontal line.

William H. Lehr


**Affidavit of
Janusz A. Ordover**

I declare under penalty of perjury that the foregoing is true and correct. Executed on
June 10, 1999.


Janusz A. Ordover

**Affidavit of
Robert D. Willig**

I declare under penalty of perjury that the foregoing is true and correct. Executed on
June 10, 1999.


Robert D. Willig

**AFFIDAVIT OF HUBBARD, LEHR, ORDOVER, AND WILLIG
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ATTACHMENT 1

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EDUCATION

- 1968-1973 Columbia University, New York, New York
Graduate Department of Economics and European Institute of the School of International
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Doctoral Dissertation: Three Essays on Economic Theory, May 1973. Ph.D. 1973.
- 1967-1968 McGill University, Montreal, Canada
Departments of Economics and Political Science
- 1963-1966 Warsaw University, Warsaw, Poland
Department of Political Economy. B.A. (equiv.), 1966.

HONORS

- 1973 Columbia University: Highest distinction for the doctoral dissertation
- 1971-1972 Columbia University: Honorary President's Fellow
- 1969-1971 Columbia University: President's Fellow
- 1967-1968 McGill University: Honors Student
- 1964, 1965 Warsaw University: Award for Academic Achievement, Department of Political Economy
- Who's Who in the World
Who's Who in America
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PROFESSIONAL EXPERIENCE

- June 1982 - Professor of Economics
present Department of Economics, New York University, New York, New York
- Sept. 1996 - Director of Masters in Economics Program
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Summer 1996- present	Lecturer International Program on Privatization and Reform Institute for International Development, Harvard University, Cambridge, Massachusetts
Aug. 1991 - Oct. 1992	Deputy Assistant Attorney General for Economics Antitrust Division United States Department of Justice, Washington, D.C.
Sept. 1989 - July 1990	Visiting Professor of Economics School of Management and Organization, Yale University, New Haven, Connecticut Lecturer in Law Yale Law School
Mar. 1984 - June 1988	Visiting Professor of Economics Universita Commerciale "Luigi Bocconi", Milan, Italy.
June 1982 - Feb. 1985	Director of Graduate Studies Department of Economics, New York University
Sept. 1982 - June 1986	Adjunct Professor of Law (part-time) Columbia University Law School, New York, New York
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June 1978 - June 1982	Associate Professor of Economics Department of Economics, New York University
Sept. 1979 - May 1990	Lecturer in Economics and Antitrust New York University Law School
Sept. 1977 - June 1978	Member, Technical Staff Bell Laboratories, Holmdel, New Jersey Associate Professor of Economics Columbia University Visiting Research Scholar Center for Law and Economics, University of Miami, Miami, Florida
Sept. 1973 - Aug. 1977	Assistant Professor of Economics New York University
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OTHER PROFESSIONAL ACTIVITIES

1997 - 1998	Consultant, Inter-American Development Bank, Washington, D.C.
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1995 - present Consultant, The World Bank, Washington, D.C.

1995 - present Senior Affiliate
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Fall 1995 Testimony, Hearings of the Federal Trade Commission
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1994 - 1996 Senior Affiliate
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1993 - 1994 Director
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1992 - 1993 Vice-Chair (*pro tempore*)
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1992 - 1995 Senior Consultant
1990 - 1991 Organization for Economic Cooperation and Development, Paris, France

1991 Member
Ad hoc Working Group on Bulgaria's Draft Antitrust Law
The Central and East European Law Initiative
American Bar Association

1990 - 1991 Advisor
Polish Ministry of Finance and Anti-Monopoly Office
Warsaw, Poland

1990 - 1991 Member
Special Committee on Antitrust
Section of Antitrust Law, American Bar Association

1990 - 1991 Director and Senior Advisor
Putnam, Hayes & Bartlett, Inc., Washington, D.C.

1990 - 1996 Member
Predatory Pricing Monograph Task Force
Section of Antitrust Law, American Bar Association

1989 Hearings on Competitive Issues in the Cable TV Industry
Subcommittee on Monopolies and Business Rights of the Senate Judiciary Committee
Washington, D.C.

1989 Member
EEC Merger Control Task Force, American Bar Association

1988 -
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American Bar Association

1987 - 1989 Adjunct Member
Antitrust and Trade Regulation Committee, The Association of the Bar of the City of New York

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1984 Speaker, "Industrial and Intellectual Property: The Antitrust Interface"
 National Institutes, American Bar Association, Philadelphia, Pennsylvania

1983 - 1990 Director
 Consultants in Industry Economics, Inc

1982 Member
 Organizing Committee
 Tenth Annual Telecommunications Policy Research Conference, Annapolis, Maryland

1981 Member
 Section 7 Clayton Act Committee, Project on Revising Merger Guidelines
 American Bar Association

1980 Organizer
 Invited Session on Law and Economics
 American Economic Association Meetings, Denver, Colorado

1978 - 1979 Member
 Department of Commerce Technical Advisory Board
 Scientific and Technical Information Economics and Pricing Subgroup

1978 – present Referee for numerous scholarly journals, publishers, and the National Science Foundation

MEMBERSHIPS IN PROFESSIONAL SOCIETIES

American Economic Association
American Bar Association

PUBLICATIONS

A. Journal Articles

"Parity Pricing and its Critics: Necessary Condition for Efficiency in Provision of Bottleneck Services to Competitors," with W. J. Baumol and R. D. Willig, *Yale Journal on Regulation*, vol. 14, Winter 1997, 146-63.

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CC DOCKET NO. 96-98**

"Entry Analysis Under the 1992 Horizontal Merger Guidelines," with Jonathan B. Baker, *Antitrust Law Journal*, vol. 61, no. 1, Summer 1992, 139-146.

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